a maximum output brightness adjustment section for adjusting maximum output brightness of a pixel of a display section in accordance with the average signal level, wherein the maximum output brightness adjustment section adjusts maximum output brightness so as to become smaller as the average signal level increases.

Please **cancel** claims 10, 17, and 39 without prejudice.

REMARKS

Applicants appreciate the Examiner's thorough examination of the subject application and, further, request reconsideration of the subject application based on the foregoing amendment and the following remarks.

Claims 1-9, 11-16, 18-38, and 40-61 are pending in the application. Claim 1 has been amended to incorporate the subject matter of claim 10; claim 16 has been amended to incorporate the subject matter of claim 17; and claim 38 has been amended to incorporate the subject matter of claim 39. Claims 1, 16, and 38 have not been amended substantively, other than to incorporate the subject matter of claims 10, 17, and 39, respectively. Claims 10, 17, and 39 have been canceled without prejudice. The amendments are fully supported by the specification as originally filed.

The specification has been amended at page 50-51, so that the signal transfer circuit 21, as shown in FIG. 4, is appropriately labeled in the specification. It is respectfully requested that objections to the specification be withdrawn.

As an initial matter, it should be pointed out that U.S. Patent Application Publication US 2001/0033260 to Nishitani et al. (hereinafter "Nishitani") is not prior art to the subject application. In the Office Action, the Applicants' claim of priority under 35 USC 119 was acknowledged. Specifically, Applicants claim priority to Japanese Application Nos. 2000-112547 and 2000-112634, both applications filed on **April 13, 2000**. Nishitani has an effective date of March 26, 2001 (its U.S. filing date). Therefore, the filing date of Nishitani is "antedated by applicant's earlier foreign priority application," and Nishitani does not qualify as prior art (see MPEP 2136.05).

In the interest of time, Applicants' have not yet submitted English language translations of the above-referenced Japanese applications; however, the Japanese applications fully support all of the claims in the U.S. application (see MPEP 2136.05 and 706.02(b)).

Applicants' claimed invention is directed to an image reproducing method, an image display apparatus, and a picture compensation device including: an average signal level operation section for obtaining an average signal level based on all pixels; an input signal – output brightness property setting section for setting an input signal – output brightness property which represents variations in brightness of a pixel with respect to the average signal level; a signal compensation section for performing compensation of a picture signal; and a maximum output brightness adjustment section for adjusting maximum output brightness of a pixel of the display apparatus in accordance with the average signal level.

FIG. 1 illustrates an image display apparatus according to the Applicants' claimed invention. Display apparatus 8 includes a plurality of pixels for displaying an image. In the average signal level operation section 1, an average input signal level of brightness G is calculated based on all of the pixel signals. Then, an input signal – output brightness property is set (e.g., a gamma value $\gamma(G)$; see reference numeral 2), in which the input signal – output brightness property is approximately represented by an exponential function. Then, in signal compensation section 4, the input picture signal is compensated so as to coincide with the setting value $\gamma(G)$. Further, in maximum output brightness adjustment circuit 3, the maximum output brightness of a pixel is adjusted according to the average input signal level of brightness G. The maximum output brightness $i_{max}(G)$ is determined, e.g., and becomes small as the average input signal level of brightness G increases (see specification at page 34).

Claims 1-6 were rejected under 35 USC §102(b) as being anticipated by U.S. Patent 5,546,134 to Lee. Claims 16, 18, 38, and 40 were rejected under 35 USC §102(e) as being anticipated by U.S. Patent 6,278,436 to Hosoi et al. (hereinafter "Hosoi"). Claims 22-26, 29-37, 42-46, and 49-61 were rejected under 35 USC §102(e)

as being anticipated by Nishitani. Claim 7 was rejected under 35 USC §103(a) as being unpatentable over Lee in view of U.S. Patent 5,734,362 to Eglit. Claims 27, 28, 47, and 48 were rejected under 35 USC §103(a) as being unpatentable over Nishitani in view of Eglit. Claims 8-15 were rejected under 35 USC §103(a) as being unpatentable over Lee in view of Nishitani. Claims 17, 19-21, 39, and 41 were rejected under 35 USC §103(a) as being unpatentable over Hosoi in view of Nishitani. These rejections are respectfully traversed.

As explained above, Nishitani is not prior art to the subject application. However, for the sake of completeness, the rejections involving Nishitani will be addressed.

With reference to claim 1 (which incorporates the subject matter of claim 10), the combination of Lee in view of Nishitani fails to teach or suggest an image reproducing method in which the image is reproduced so that maximum output brightness of a pixel of the display apparatus varies in accordance with the average signal level, as required in claim 1.

Lee teaches an image enhancement circuit which includes an average picture level (APL) calculator 20 and a look-up table block 30 (see FIG. 5, as cited in the Office Action). The APL calculator 20 calculates an nAPL value of the video input signal with respect to one or more frame periods (see column 5, lines 16-19).

However, Lee fails to teach or suggest an image display apparatus or image reproducing method in which the image is reproduced so that maximum brightness of a pixel of the display apparatus varies according to the average signal level. Nishitani fails to remedy the deficiencies of the Lee reference.

In Nishitani, the image is reproduced in accordance with the brightness value of the video signal, not the average signal level across all pixels. For example, with reference to FIG. 2 of Nishitani, the luminance signal generation section determines a luminance value (Y) on every picture element from inputted RGB digital video data and outputs the results to the switching circuit 10-12 (see page 4, paragraph 0063). The

input data is sent to the microcomputer control section 23, which generates polygonal line point data, which is output to the display panel 4 (see paragraph 0064). In Nishitani, the image is reproduced based on the brightness value of the picture signal. In contrast, the Applicants' claimed invention requires that the image signal is reproduced so that the maximum output brightness of a pixel of the display apparatus varies according to the **average** signal level. The brightness value of the picture signal in Nishitani clearly is different from the average signal level as recited in the Applicants' claimed invention.

With reference to claim 16 (which incorporates the subject matter of claim 17), the combination of Hosoi in view of Nishitani fails to teach or suggest an image reproducing method in which the image is reproduced so that the maximum output brightness of a pixel of the display apparatus varies in accordance with the average signal level, wherein the image is reproduced so that the maximum output brightness becomes smaller as the average signal level increases, as required in claim 16.

In Hosoi, an image is reproduced based on the average signal level. Hosoi does not teach or suggest reproducing an image so that the maximum output brightness becomes smaller as the average signal level increases. As explained above, Nishitani utilizes the brightness level of the video signal to reproduce the image, not the average signal level. Therefore, the display apparatus and method of Nishitani are clearly different from the Hosoi reference and the Applicants' claimed invention, and Nishitani cannot be combined with Hosoi to produce the Applicants' invention of claim 16.

With reference to claim 22, which was rejected as being anticipated by Nishitani, as discussed above, Nishitani does not teach or suggest an image display apparatus which reproduces an image based on the average signal level. Instead, Nishitani utilizes the brightness level of the video signal, which is clearly different from the average signal level.

With reference to claim 38 (which incorporates the subject matter of claim 39), the combination of Hosoi in view of Nishitani fails to teach or suggest an image display apparatus having a maximum output brightness adjustment section which adjusts

maximum output brightness so as to become smaller as the average signal level increases. As explained above with reference to claim 16, in Hosoi, an image is reproduced based on the average signal level, whereas Nishitani utilizes the brightness level of the video signal to reproduce the image.

With reference to claims 42 and 57, which were rejected as being anticipated by Nishitani, as discussed above, Nishitani does not teach or suggest a picture signal compensation device which reproduces an image based on the average signal level. Instead, Nishitani utilizes the brightness level of the video signal, which is clearly different from the average signal level.

It is believed that the claims are now in condition for allowance. However, if there are any outstanding issues, the Examiner is urged to call the Applicants' representative at the telephone number listed below.

Applicants believe that additional fees are not required for consideration of the within response. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, the Commissioner is hereby authorized and requested to charge Deposit Account No. **04-1105**.

Respectfully submitted,
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APPENDIX A:
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

The paragraph on page 50, last three lines to page 51, first five lines has been amended as follows:

The picture signal compensation device 27 is identical to the picture signal compensation circuit 7 of the Second Embodiment except for an arrangement in which a signal [conversion] transfer circuit 21 is inserted between the γ(G) compensation circuit 5 and inverse property compensation circuit 6 of the Second Embodiment, and an output of the output brightness adjustment circuit 13 is supplied to the signal [conversion] transfer circuit 21.

The paragraph on page 51, lines 6-10 has been amended as follows:

The signal [conversion] transfer circuit 21 multiplies a signal level $g_1$ of the picture signal $g_1$ from the γ(G) compensation circuit 5 by maximum output brightness $i_1$ (= $i_{max}(G) = \alpha \cdot I_{max}(G)$) so as to output the resultant picture signal $g_2$ to the inverse property compensation circuit 6.

IN THE CLAIMS

Claims 1, 11, 12, 14-16, and 38 have been amended as follows:

1. (Amended) An image reproducing method for reproducing an image by a display apparatus having a plurality of pixels based on a picture signal including a pixel signal representing information of each pixel, comprising the steps of:

performing an operation to obtain an average signal level which is an average level of all the pixel signals, then, setting an input signal - output brightness property which represents variations in brightness of a pixel with respect to the level of a pixel signal in accordance with the average signal level; [and]

reproducing an image so as to satisfy the input signal - output brightness property thus set; and

reproducing the image so that maximum output brightness of a pixel of the display apparatus varies in accordance with the average signal level.

11. (Amended) The method as set forth in claim [10] 1, wherein the image is reproduced so that the maximum output brightness becomes small as the average signal level increases.

12. (Amended) The method as set forth in claim [10] 1, wherein:

in order to reproduce the image, an operation to obtain the maximum output brightness of a pixel of the display apparatus is performed according to the average signal level, then, compensation is further performed on the picture signal subject to the compensation according to the input signal - output brightness property that is set, based on a result of the operation for the maximum output brightness, and the picture signal subject to this compensation is outputted to the display apparatus.

14. (Amended) The method as set forth in claim [10] 1, wherein:

the image is reproduced so that an exponential value in which the input signal - output brightness property is approximately represented by an exponential function becomes larger as the average signal level increases, and the maximum output brightness becomes smaller as the average signal level increases.

15. (Amended) The method as set forth in claim [10] 1, wherein:

when the pixel signal includes a brightness signal which represents brightness information of each pixel, the operation for the average signal level is made by performing an operation to obtain an average level of all the brightness signals.

16. (Amended) An image reproducing method for reproducing an image by a display apparatus having a plurality of pixels based on a picture signal including a pixel signal representing information of each pixel, wherein:

an image is reproduced so that, after performing an operation to obtain an average signal level which is an average level of all the pixel signals, maximum output brightness of a pixel of the display apparatus varies in accordance with the average

signal level, wherein the image is reproduced so that the maximum output brightness becomes smaller as the average signal level increases.

38. (Amended) An image display apparatus which includes a display section having a plurality of pixels for displaying an image and receives a picture signal including a pixel signal representing information of each pixel, comprising:

an average signal level operation section for performing an operation to obtain an average signal level which is an average level of all the pixel signals; and

a maximum output brightness adjustment section for adjusting maximum output brightness of a pixel of a display section in accordance with the average signal level, wherein the maximum output brightness adjustment section adjusts maximum output brightness so as to become smaller as the average signal level increases.

Claims 10, 17, and 39 have been canceled without prejudice.